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GB 2012342A  
GB 1296055  
GB 1236537  
GB 1066982  
GB 911225  
GB 910110  
GB 355314

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(54) A building façade

(57) A building façade is made up of ceramic tiles with undercut lands 2 for interengagement with fixing means 3 attached to, or forming part of, a tile

supporting and backing structure on a wall to be covered by the façade. For keeping the lands on the back of each tile of uniform size and uniformly spaced-apart, a coating, e.g. of synthetic resin may be provided on the back surface of each tile.

FIG. 1

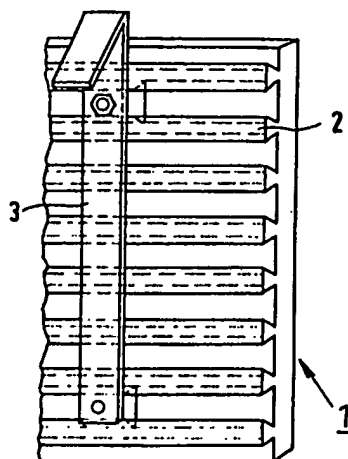
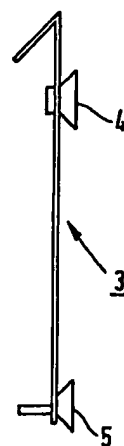


FIG. 2



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FIG. 1

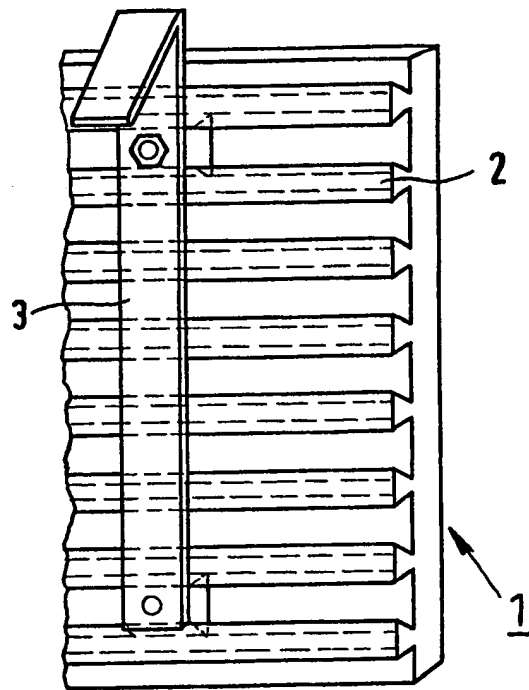
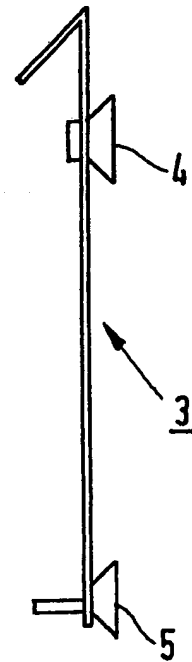


FIG. 2



## SPECIFICATION

### A building façade

This invention relates to a building façade made up of ceramic tiles having undercut lands on their back sides.

Façade coverings may be made using, for example, split tiles (tiles formed, e.g. extruded, prior to firing so as to be joined together back-to-back and subsequently separated after firing) which have long lands of typically dovetail cross-section enabling the tiles to be keyed in a bed of mortar on the building in question. In order to enable thin mortar beds to be employed, so minimising the amount of mortar used, there has been a tendency for the lands on such tiles to be made lower and lower in height so that at present ceramic tiles are provided with lands having only a small elevation.

There are a number of shortcomings in connection with the laying of such ceramic tiles, provided with small elevation lands, for making an outdoor façade on a building. One shortcoming is that, because of the different rate of natural thermal expansion of outdoor façades made from such ceramic tiles, the embedded split tiles have the tendency to become loose and drop off. Furthermore it is not possible for tiles to be laid on the mortar bed without the formation of bubbles or air spaces of some size. These hollows of air enable moisture, which makes its way in through the pointing between the separate tiles, to be taken up. Any water in the hollows will then be turned into ice in cold weather when subjected to sub-zero temperatures. The ice occupies a greater volume than the water thus causing the bond between the mortar and the tiles to be loosened so increasing the possibility of the tiles coming away from the mortar. Alternatively, or in addition, moisture may make its way into the hollows from the inside of the building so that the same effect is produced.

In the case of building façade tiles of great size, which in some cases may be made of ceramic material, the method of fixing them to a building has changed so that, instead of employing a bed of mortar to fix the tiles, the tiles are fixed, e.g. to the building brickwork, by a gripping structure or clips, so that the tiles are not acted upon directly by the brickwork (because of expansion or the like) and the back sides of the tiles are ventilated.

There has of late been a suggestion to have holes in ceramic tiles for nailing or screwing them in position to a grid, more specially of wood, or the like on the wall of the building.

One aim of the present invention is to provide a building façade in which ceramic tiles are fixed to a supporting structure without making use of a mortar bed or fixing means, e.g. screws or nails, which pass through holes formed in the tiles.

According to the present invention a building façade made up of ceramic tiles having undercut lands on their back sides, is characterised in that fixing means attached to, or forming part of, a tile supporting and backing structure are provided

with interengaging means which interengage with the undercut lands to hold the tiles in position.

The tile supporting and backing structure is typically in the form of a grid or framework, for example made up of aluminum rods so that the structure is completely regular and very true to size.

Conveniently the ceramic tiles are split tiles and have lands of substantially dovetail cross-section.

As part of a further development of the invention, for taking into account tolerances in size (which are always present in ceramic materials) the back faces of the tiles may be coated with synthetic resin. This makes it possible for the undercut sides of the lands to be accurately formed and to be regularly spaced, if this was not the case beforehand. This not only makes it very much simpler for the tiles to be fixed in place, but furthermore makes it unnecessary to have any further tile supporting structures for loading the tiles and preventing any looseness of the tiling structure. The synthetic resin coating may be made of such a thickness that it itself has lands or male parts or the like which interengage with said interengaging means.

With the invention it becomes possible, even with the comparatively large tolerances encountered with ceramic tiles, to make a building façade which is ventilated by having a space between it and the supporting building wall. Furthermore the tiles can be very precisely positioned in relation to each other and, because of the design of the tile supporting and backing structure, the whole façade is generally rigid.

The invention will now be described, by way of example, with reference to the accompanying drawing, in which:

Figure 1 is a perspective view of part of a building façade according to the invention showing part of a split tile with fixing means attached thereto; and

Figure 2 is a side view of the fixing means shown in Figure 1.

Figure 1 shows a split ceramic tile 1 having dovetail section lands 2, the tile having been produced by forming a pair of such split tiles by extrusion prior to firing and subsequently splitting the pair into two single tiles after firing, the pair of joined tiles being joined by their dovetail section lands.

Previously these dovetail section lands 2 have been bedded in a thick coating of mortar on a building wall to provide the building with a façade. However in the present application a building façade is built by attaching a plurality of tiles 1 to a tile supporting and backing structure (not shown) via a plurality of fixing means. Each fixing means comprises a fixing part 3 (see Figure 2) having mounted thereon a pair of interengaging means, in the form of a dovetail-like nosepieces 4 and 5, which interlock or interengage with recesses defined between adjacent pairs of lands 2. The nosepieces 4 and 5 may be fixed in position on the fixing part 3. Alternatively one or both of the nosepieces may be mounted in a slot (not

shown) extending along the length of the fixing part so that the relative spacing apart of the nosepieces 4 and 5 may be adjusted to bring them in line with the spacing between the dovetail section recesses defined between each adjacent pair of dovetail section lands 2 on the backs of the split tiles. It is possible for one, or more than two, nosepieces to be provided on each fixing part 3.

Each fixing part 3 has a hook at one end to enable it to be fixed to, e.g. detachably suspended from, a tile supporting and backing structure, e.g. a grid of aluminum rods. It is of course possible for the hook to have a different form or, indeed, for the fixing part 3 to have other attachment means to enable it to be attached to the tile supporting and backing structure.

If the positions of the nosepieces 4 and 5 are not adjustable relative to each other, it is possible to obtain a stronger, more rigid façade. However in this case it is highly desirable to coat the back side of each split tile 1 with synthetic resin, care being taken to see that the dovetail section lands on the tile, made up partly of synthetic resin and partly of tile material, are free of any tolerance. The synthetic resin may be self-lubricating so that the nosepieces 4 and 5 of the fixing part 3 may be readily slipped along the undercut sides of the lands sideways.

It is also possible for the back side of the ceramic material of the split tiles not to be provided with lands. In this case the tiles are backed with synthetic resin which will then have the (new) lands formed on its back free face. The fixing parts 3 are best made of a metal, although they may also be made of synthetic resin.

The design of the ceramic tile itself is in other respects not dependent on the design of the fixing structure and the tiles may have stepped edges so that there is overlap between one tile edge and the next one. The invention is naturally not limited to the normal split tile size and smaller or, more specially greater sizes, of tiles may be fixed using the fixing parts of the present invention.

If the tiles are synthetic resin backed, the edges of the coating may be stepped and designed to extent past the limits of the tile ceramic material. In place of a coating of synthetic resin it is possible, naturally, for the ceramic tile to be backed with metal or the like.

In a further embodiment of the invention, interengaging means in the form of buttons, rails or the like are made on the tile supporting and backing structure itself, such nosepieces being of a giving but elastic material, e.g. a resilient material such as synthetic resin, and having the function of press-studs so that when the ceramic tiles are pushed directly onto these interengaging means, their dovetail section recesses, formed between adjacent lands, will become locked on them. In the case of the façade of the invention it will be seen, for this reason, that the tiles may be pushed on to the supporting system by force so that they become locked and keyed in position or they may be slipped onto the supporting system sideways. The undercut lands naturally do not

have to be made with sharp edges and in fact may have an outwardly curved outline.

It should also be realised that it is possible for the interengaging means to comprise a female portion for interengagement with the male portion lands of the tiles.

## CLAIMS

1. A building façade made up of ceramic tiles having undercut lands on their back sides, is characterised in that fixing means attached to, or forming part of, a tile supporting and backing structure are provided with interengaging means which interengage with the undercut lands to hold the tiles in position.

2. A building façade according to claim 1, in which the fixing means are attached to the tile supporting and backing structure, each fixing means having at least two interengaging means mounted thereon.

3. A building façade according to claim 2, in which the interengaging means are mounted to enable adjustment of the relative separation therebetween.

4. A building façade according to any of the preceding claims, in which the ceramic tiles are backed with a coating of synthetic resin.

5. A building façade according to any of claims 1 to 3, in which the ceramic tiles are backed with a coating of metallic material.

6. A building façade according to claim 4 or 5, in which the said undercut lands are formed in the said coating.

7. A building façade according to claim 4 or 5, in which the said undercut lands on each tile are defined by undercut land portions formed in the ceramic tile material and the said coating which covers said undercut land portions.

8. A building façade according to any of claims 4 to 7, in which the backing coatings are stepped at their edges, the coatings extending past the edge of the ceramic material of the tiles.

9. A building façade according to any of the preceding claims, in which at least one side edge of each tile is stepped.

10. A building façade according to any of the preceding claims, in which each of said lands has a substantially dovetail cross-section.

11. A building façade according to claim 9, in which each of said interengaging means has a substantially dovetail cross-section to enable it to be interengaged with corresponding dovetail-shaped recesses defined between adjacent ones of said undercut lands formed on each tile.

12. A building façade according to any of claims 1 to 10, in which each interengaging means is resiliently deformable and is snap-fitted into any one of the recesses defined between adjacent ones of said undercut lands formed on each tile.

13. A building façade according to any of the preceding claims, in which each fixing means is detachably attached to, e.g. suspended from horizontal rails of, said tile supporting and backing structure.

14. A building façade constructed and arranged substantially as hereinbefore described with reference to, and as illustrated in, Figures 1 and 2

5 of the accompanying drawing.  
15. A building having a façade according to any of the preceding claims.

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